

CPC**COOPERATIVE PATENT CLASSIFICATION****F16B****DEVICES FOR FASTENING OR SECURING CONSTRUCTIONAL ELEMENTS OR MACHINE PARTS TOGETHER, e.g. NAILS, BOLTS, CIRCLIPS, CLAMPS, CLIPS, WEDGES, JOINTS OR JOINTING****NOTE**

Attention is drawn to:
the Note following group [E04B 1/38](#);

the following places:

[A44B](#) Buckles, slide fasteners
[A47G 3/00](#) Ornamental heads for nails, screws, or the like
[B42F 3/00](#) Means, not using staples, for attaching sheets temporarily together
 {[C14B 17/08](#) Fastening devices, e.g. clips for leather-stretching used in apparatus or machines for manufacturing or treating skins, hides, leathers or furs}
[E01B 9/10](#) Screws or bolts for railway sleepers
[E01B 11/00](#) Rail joints
[E04](#) Connections for building
[E04D 13/08](#) Clamping means for down pipes for roof drainage
[E04G 5/04](#) Fastening scaffolds against buildings
[E04G 7/00](#) Scaffolding couplings
[E05C](#) Bolts for fasteners for wings, specially for doors or windows
[F16C 29/10](#) Locking bearings for parts moving only linearly
[F16G 17/00](#) Hooks as integral parts of chains
[F16L](#) Pipe joints
[F16L 3/00](#) Supports for pipes, cables or protective tubing, e.g. hangers, holders, clamps, cleats, clips, brackets
[F16L 33/02](#) Clips for connecting hoses to rigid members
[H01F 7/00](#) Magnetic holding devices
[H02N 13/00](#) Electrostatic holding devices.

Groups [F16B 2/00](#) to [F16B 47/00](#) take precedence over group [F16B 1/00](#).

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

[F16B 7/08](#) covered by [F16B 5/12](#), [F16B 7/04](#), [F16L 3/00](#)
[F16B 7/12](#) " " [F16L 7/10B](#)
[F16B 7/16](#) " " [F16L 7/14](#)
[F16B 13/10](#) " " [F16B 13/08](#)
[F16B 13/13](#) " " [F16B 13/002](#), [F16B 13/12](#)
[F16B 21/14](#) " " [F16B 21/12](#), [F16B 21/125](#)
[F16B 25/02](#) " " [F16B 25/00](#)
[F16B 25/04](#) " " [F16B 25/00](#)
[F16B 25/06](#) " " [F16B 25/00](#)
[F16B 25/08](#) " " [F16B 25/00](#)
[F16B 33/04](#) " " [F16B 33/02](#)

[F16B 37/10](#) " " [F16B 37/0842](#), [F16B 37/0871](#)

F16B 1/00 **Devices for securing together, or preventing relative movement between, constructional elements or machine parts**

- F16B 1/0014 . {by the use of a shape-memory material}
- F16B 1/005 . {by the use of a hydraulic action}
- F16B 1/0057 . {by the use of a pneumatic action}
- F16B 1/0071 . { with markings, colours, indicators or the like (for indicating tensile load [F16B 31/02](#))}
- F16B 1/02 . Means for securing elements of mechanisms after operation (means for bringing members to rest [F16D](#))
- F16B 1/04 . . . disengaged by movement of the actuating member of the element (locking of actuators [G05G](#), e.g. [G05G 5/00](#))

Fastenings for constructional elements or machine parts in general (couplings for transmitting rotation [F16D](#))

F16B 2/00 **Friction-grip releasable fastenings (for cables or ropes, e.g. cleats [F16G 11/00](#)){(connections of rods or tubes, e.g. of non-circular section, mutually, including resilient connections [F16B 7/00](#))}**

- F16B 2/005 . {Means to increase the friction-coefficient}
- F16B 2/02 . Clamps, i.e. with gripping action effected by positive means other than the inherent resistance to deformation of the material of the fastening
- F16B 2/04 . . . internal, i.e. with spreading action ([F16B 2/14](#) to [F16B 2/18](#) take precedence)
- F16B 2/06 . . . external, i.e. with contracting action ([F16B 2/14](#) to [F16B 2/18](#) take precedence)
- F16B 2/065 . . . {using screw-thread elements ([F16B 2/08](#) to [F16B 2/12](#) take precedence)}
- F16B 2/08 . . . using bands
- F16B 2/10 . . . using pivoting jaws
- F16B 2/12 . . . using sliding jaws
- F16B 2/14 . . . using wedges
- F16B 2/16 . . . using rollers or balls {(clamps for rods or tubes telescopically engaged [7/14B](#); used in anti-theft monitors, e.g. as used for articles of clothing in shops [E05B 73/0017](#))}
- F16B 2/18 . . . using cams, levers, eccentrics, or toggles {(for connections of rods or tubes engaged telescopically [F16B 7/1418](#), [F16B 7/1427](#), [F16B 7/1454](#))}
- F16B 2/185 . . . { using levers}

- F16B 2/20 . Clips, i.e. with gripping action effected solely by the inherent resistance to deformation of the material of the fastening
- F16B 2/205 .. {with two stable positions}
- F16B 2/22 .. of resilient material, e.g. rubbery material {(F16B 2/205 takes precedence)}
- F16B 2/24 ... of metal
- F16B 2/241 {of sheet metal}
- F16B 2/243 {internal, i.e. with spreading action}
- F16B 2/245 {external, i.e. with contracting action}
- F16B 2/246 {the clip being released by tilting the clip or a part thereof to a position in which the axis of the openings surrounding the gripped elements is parallel to, or coincides with, the axis of the gripped elements}
- F16B 2/248 {of wire}
- F16B 2/26 .. of pliable, non-resilient material, e.g. plant tie
- F16B 3/00** **Key-type connections; Keys** (F16B 2/00 takes precedence; for rods or tubes mutually F16B 7/00)
- F16B 3/005 . {the key being formed by solidification of injected material (joining of preformed parts by applying molten plastics B29C 65/40; non-disconnectible pipe joints obtained using a hardenable filler F16L 13/11)}
- F16B 3/04 . using keys formed of wire or other flexible material, to be inserted through an opening giving access to grooves in the adjacent surfaces of the parts to be connected
- F16B 3/06 . using taper sleeves
- F16B 4/00** **Shrinkage connections, e.g. assembled with the part at different temperature; Force fits** (restricted to metal parts or objects B23P 11/02); **Non-releasable friction-grip fastenings** (F16B 2/00 takes precedence; {using members with a shape-memory material F16B 1/0014})
- F16B 4/002 . {engaging or disengaging by means of fluid pressure}
- F16B 4/004 . {Press fits, force fits, interference fits, i.e. fits without heat or chemical treatment (F16B 4/002 takes precedence)}
- F16B 4/006 . {Shrinkage connections, e.g. assembled with the parts being at different temperature}
- F16B 4/008 .. {using heat-recoverable, i.e. shrinkable, sleeves}
- F16B 5/00** **Joining sheets or plates, {e.g. panels}, to one another or to strips or bars parallel to them** {(F16B 17/002 takes precedence); by sticking together F16B 11/00; dowel connections F16B 13/00; pins, including deformable elements F16B 19/00; covering of walls E04F 13/00; fastening signs, plates, panels or boards to a supporting structure, fastening readily-detachable elements, e.g. letters to signs, plates, panels, or boards, G09F 7/00)
- F16B 5/0004 . {Joining sheets, plates or panels in abutting relationship (F16B 5/01 takes precedence)}

- F16B 5/0008 . . {by moving the sheets, plates or panels substantially in their own plane, perpendicular to the abutting edge}
- F16B 5/0012 . . . {a tongue on the edge of one sheet, plate or panel co-operating with a groove in the edge of another sheet, plate or panel}
- F16B 5/0016 {with snap action}
- F16B 5/002 . . . {both sheets, plates or panels having a groove, e.g. with strip-type connector}
- F16B 5/0024 . . . {the sheets, plates or panels having holes, e.g. for dowel- type connections}
- F16B 5/0028 . . . { using I-shaped connectors (with flanges moving towards each other [F16B 5/0068](#))}
- F16B 5/0032 . . {by moving the sheets, plates, or panels or the interlocking key parallel to the abutting edge}
- F16B 5/0036 . . . {and using hook and slot or keyhole-type connections}
- F16B 5/004 . . . {and using C-shaped clamps}
- F16B 5/0044 . . . {and using interlocking keys of circular, square, rectangular or like shape}
- F16B 5/0048 {hinge-like}
- F16B 5/0052 . . . {the interlocking key acting as a dovetail-type key}
- F16B 5/0056 . . {by moving the sheets, plates or panels or the interlocking key perpendicular to the main plane}
- F16B 5/006 . . . {and using ring-shaped clamps}
- F16B 5/0064 . . . {and using C-shaped clamps}
- F16B 5/0068 . . . {and using I-shaped clamps with flanges moving towards each other}
- F16B 5/0072 {and using screw-thread}
- F16B 5/0076 . . . {and using expanding clamps}
- F16B 5/008 . . {by a rotating or sliding and rotating movement}
- F16B 5/0084 . . {characterised by particular locking means (not used, see subgroups)}
- F16B 5/0088 . . . {with locking means moving substantially perpendicular to the main plane, e.g. pins, screws}
- F16B 5/0092 . . . {with locking means rotating about an axis parallel to the main plane and perpendicular to the abutting edge, e.g. screw, bayonet}

- F16B 5/0096 . {by using permanent deformation}

- F16B 5/01 . . by means of fastening elements specially adapted for honeycomb panels

- F16B 5/02 . . by means of fastening members using screw-thread ([F16B 5/0004](#) takes precedence); construction of screw-threaded connections [F16B 25/00](#) to [F16B 39/00](#))
- F16B 5/0208 . . {using panel fasteners, i.e. permanent attachments allowing for quick assembly}
- F16B 5/0216 . . {the position of the plates to be connected being adjustable}
- F16B 5/0225 . . . {allowing for adjustment parallel to the plane of the plates}
- F16B 5/0233 . . . {allowing for adjustment perpendicular to the plane of the plates}
- F16B 5/0241 . . {with the possibility for the connection to absorb deformation, e.g. thermal or vibrational}
- F16B 5/025 . . {specially designed to compensate for misalignment or to eliminate unwanted play}
- F16B 5/0258 . . {using resiliently deformable sleeves, grommets or inserts ([43/00B](#) takes precedence)}

- F16B 5/0266 .. {using springs}
- F16B 5/0275 .. { the screw-threaded element having at least two axially separated threaded portions ([F16B 5/0283](#) takes precedence)}
- F16B 5/0283 .. {with an externally threaded sleeve around the neck or the head of the screw-threaded element for adjustably fastening a plate or frame or the like to a fixed element}
- F16B 5/0291 .. {the threaded element being driven through the edge of a sheet plate with its axis in the plane of the plate}

- F16B 5/04 . by means of riveting ([rivets F16B 19/04](#))
- F16B 5/045 .. {without the use of separate rivets}

- F16B 5/06 . by means of clamps or clips ([F16B 5/0004](#) takes precedence); friction-grip releasable fastenings in general [F16B 2/00](#))
- F16B 5/0607 .. {joining sheets or plates to each other ([F16B 5/0692](#), [F16B 21/082](#) take precedence)}
- F16B 5/0614 ... {in angled relationship}
- F16B 5/0621 ... {in parallel relationship ([fastened by a drive-pin 19/10B2D](#); [fastened by a device locking by rotation F16B 21/02](#))}
- F16B 5/0628 {allowing for adjustment parallel or perpendicular to the plane of the sheets or plates}
- F16B 5/0635 {fastened over the edges of the sheets or plates}
- F16B 5/0642 { the plates being arranged one on top of the other and in full close contact with each other}
- F16B 5/065 { the plates being one on top of the other and distanced from each other, e.g. by using protrusions to keep contact and distance}
- F16B 5/0657 { at least one of the plates providing a raised structure, e.g. of the doghouse type, for connection with the clamps or clips of the other plate}
- F16B 5/0664 { at least one of the sheets or plates having integrally formed or integrally connected snap-in-features}
- F16B 5/0685 .. {Joining sheets or plates to strips or bars ([F16B 5/0692](#) takes precedence)}
- F16B 5/0692 .. {joining flexible sheets to other sheets or plates or to strips or bars ([tent fastenings E04H 15/64](#); [coping elements for swimming pools with fixing means for sealing foil E04H 4/142](#); [greenhouses of flexible synthetic material A01G 9/1407](#); [end or aperture-closing arrangements or devices for sacks or bags B65D 33/16](#))}

- F16B 5/07 . by means of multiple interengaging protrusions on the surfaces, e.g. hooks, coils,
- F16B 5/08 . by means of welds or the like ([welding B23K](#))

- F16B 5/10 . by means of bayonet connections ([F16B 5/0092](#) takes precedence); fastening devices locking by rotation [F16B 21/02](#))

- F16B 5/12 . Fastening strips or bars to sheets or plates, e.g. rubber strips, decorative strips for motor vehicles, by means of clips ([friction- grip releasable fastenings in general F16B 2/00](#); [fastening rods or tubular parts to flat surfaces at an angle F16B 9/00](#))
- F16B 5/121 .. {fastened over the edge(s) of the sheet(s) or plate(s)}
- F16B 5/123 .. { Auxiliary fasteners specially designed for this purpose}
- F16B 5/125 ... { one of the auxiliary fasteners is comprising wire or sheet material or is made thereof}

- F16B 5/126 .. { at least one of the sheets, plates, bars or strips having integrally formed or integrally connected snap-in-features}
- F16B 5/128 .. { a strip with a C-or U-shaped cross section being fastened to a plate such that the fastening means remain invisible, e.g. the fastening being completely enclosed by the strip}
- F16B 7/00** **Connections of rods or tubes, e.g. of non-circular section, mutually, including resilient connections** ({[F16B 11/008](#), [F16B 17/002](#) take precedence}; umbrella frames [A45B 25/02](#); welding or soldering of connections [B23K](#); vehicle connections in general [B60D](#); railway couplings [B61G](#); bicycle frames [B62K](#); couplings for transmitting rotation [F16D](#); couplings for tubes conveying fluids [F16L](#))
- F16B 7/02 . with conical parts
- F16B 7/025 .. {with the expansion of an element inside the tubes due to axial movement towards a wedge or conical element (for rods or tubes telescopically engaged [F16B 7/1463](#))}
- F16B 7/04 . Clamping or clipping connections (friction-grip releasable fastenings in general [F16B 2/00](#))
- F16B 7/0406 .. {for rods or tubes being coaxial ([F16B 7/10](#) takes precedence)}
- F16B 7/0413 ... {for tubes using the innerside thereof ([F16B 7/025](#) takes precedence)}
- F16B 7/042 {with a locking element, e.g. pin, ball or pushbutton, engaging in a hole in the wall of at least one tube}
- F16B 7/0426 ... {for rods or for tubes without using the innerside thereof}
- F16B 7/0433 .. {for rods or tubes being in parallel relationship}
- F16B 7/044 .. {for rods or tubes being in angled relationship}
- F16B 7/0446 ... {for tubes using the innerside thereof ([F16B 7/025](#) takes precedence)}
- F16B 7/0453 {the tubes being drawn towards each other ([F16B 7/0473](#) takes precedence)}
- F16B 7/046 {by rotating an eccentric-mechanism}
- F16B 7/0466 {by a screw-threaded stud with a conical tip acting on an inclined surface}
- F16B 7/0473 {with hook-like parts gripping, e.g. by expanding, behind the flanges of a profile}
- F16B 7/048 ... {for rods or for tubes without using the innerside thereof}
- F16B 7/0486 {forming an abutting connection of at least one tube}
- F16B 7/0493 {forming a crossed-over connection}
- F16B 7/06 . Turnbuckles (for cables, ropes, or wire [F16G 11/12](#))
- F16B 7/10 . Telescoping systems { for vertically adjustable chairs [A47C 3/20](#); telescopic steering columns [B62D 1/18](#); for scaffolding [E04G 25/04](#); { telescopic masts, poles or the like [E04H 12/18B](#); telescopic door or window holders [E05C 17/30](#)}; telescope props for mining [E21D 15/14](#) to [E21D 15/46](#); stands or trestles as supports for apparatus or articles placed thereon {[F16M 11/26](#)}
- F16B 7/105 .. {locking in discrete positions, e.g. in extreme extended position}
- F16B 7/14 .. locking in intermediate {non-discrete} positions {(the rod or tube being locked by a tilting clip [F16B 2/246](#))}
- F16B 7/1409 ... {with balls or rollers urged by an axial displacement of a wedge or a conical member}

- F16B 7/1418 . . . {with a clamping collar or two split clamping rings tightened by a screw or a cammed latch member}
- F16B 7/1427 . . . {with cammed or eccentric surfaces co-operating by relative rotation of the telescoping members or by rotation of an external collar}
- F16B 7/1436 {with rollers or balls}
- F16B 7/1445 . . . {with a rubber bushing gripping inside the outer telescoping member by a radial expansion due to its axial compression ([F16B 7/1463](#) takes precedence)}
- F16B 7/1454 . . . {with a clamp locking the telescoping members by swinging a handle provided with a locking cam ([F16B 7/1418](#) takes precedence)}
- F16B 7/1463 . . . {with the expansion of an element inside the outer telescoping member due to the axial movement towards a wedge or a conical member}
- F16B 7/1472 . . . {with a clamping screw perpendicular to the axis of the telescoping members}
- F16B 7/1481 . . . {with a gripping helical spring}
- F16B 7/149 . . . {with a sleeve or ring having a tapered or conical surface ([F16B 7/1463](#) takes precedence)}

- F16B 7/18 . . using screw-thread elements ({[F16B 7/025](#) takes precedence; for turnbuckles [F16B 7/06](#)})
- F16B 7/182 . . {for coaxial connections of two rods or tubes}
- F16B 7/185 . . {with a node element}
- F16B 7/187 . . {with sliding nuts or other additional connecting members for joining profiles provided with grooves or channels (channel nuts per se [F16B 37/045](#))}

- F16B 7/20 . . using bayonet connections

- F16B 7/22 . . using hooks or like elements

- F16B 9/00** **Connections of rods or tubular parts to flat surfaces at an angle** ({[F16B 17/002](#) takes precedence}; friction-grip releasable fastenings in general [F16B 2/00](#); making press-fit connections [B23P 11/00](#), [B23P 19/00](#); fluid-tight connecting of pipes to reservoirs, sheets, or the like [F16L](#), e.g. joining pipes to walls [F16L 41/00](#))

- F16B 9/02 . . Detachable connections
- F16B 9/023 . . {using clamps or clips}
- F16B 9/026 . . {using screw-thread elements}

- F16B 11/00** **Connecting constructional elements or machine parts by sticking or pressing them together, e.g. cold pressure welding** (non-electric welding in general [B23K](#); methods of using adhesives independently of the form of the surfaces joined [C09J 5/00](#))

- F16B 11/002 . . {by pressing the elements together so as to obtain plastic deformation (shrinkage connections, force fits [F16B 4/00](#); pin-and-hole connections [F16B 17/00](#))}

- F16B 11/004 . . {by cold pressure welding}

- F16B 11/006 . . { by gluing (gluing of plastics material [B29C 65/48](#))}
- F16B 11/008 . . {of tubular elements or rods in coaxial engagement}

- F16B 12/00** **Jointing of furniture or the like, e.g. hidden from exterior** ([F16B 2/00](#) to [F16B 11/00](#) take precedence; fastening means per se [F16B 13/00](#) to [F16B 47/00](#); wood-working B27)
- F16B 12/02 . Joints between panels and corner posts
- F16B 12/04 . Non-loosenable joints for non-metal furniture parts, e.g. glued
- F16B 12/06 . Non-loosenable joints for metal furniture parts
- F16B 12/08 .. without use of separate connecting elements
- F16B 12/10 . using pegs, bolts, tenons, clamps, clips, or the like ([glued F16B 12/04](#); fastening means per se [F16B 15/00](#) to [F16B 47/00](#))
- F16B 12/12 .. for non-metal furniture parts, e.g. made of wood, of plastics
- F16B 12/125 ... {using mortise and tenon joints}
- F16B 12/14 ... using threaded bolts or screws
- F16B 12/16 using self-tapping screws
- F16B 12/18 using drawing bars
- F16B 12/20 ... using clamps, clips, wedges, sliding bolts, or the like
- F16B 12/2009 {actuated by rotary motion}
- F16B 12/2027 {with rotating excenters or wedges}
- F16B 12/2036 {with rotating excenters or wedges acting on a head of a pin or screw}
- F16B 12/2054 {with engaging screw threads as securing means for limiting movement}
- F16B 12/2063 {with engaging screw threads as tightening means}
- F16B 12/22 ... using keyhole-shaped slots and pins
- F16B 12/24 ... using separate pins, dowels, or the like
- F16B 12/26 ... using snap-action elements
- F16B 12/28 .. for metal furniture parts
- F16B 12/30 ... using threaded bolts
- F16B 12/32 ... using clamps, clips, wedges, sliding bolts, or the like
- F16B 12/34 ... using keyhole-shaped slots and pins
- F16B 12/36 ... using separate pins, dowels or the like
- F16B 12/38 ... using snap-action elements
- F16B 12/40 . Joints for furniture tubing
- F16B 12/42 .. connecting furniture tubing to non-tubular parts {(connecting table tops to underframes [A47B 13/003](#))}
- F16B 12/44 . Leg joints; Corner joints
- F16B 12/46 .. Non-metal corner connections
- F16B 12/48 .. Non-metal leg connections ([F16B 12/46](#) takes precedence)
- F16B 12/50 .. Metal corner connections
- F16B 12/52 .. Metal leg connections ([F16B 12/50](#) takes precedence)
- F16B 12/54 . Fittings for bedsteads or the like

- F16B 12/56 .. Brackets for bedsteads; Coupling joints consisting of bolts or the like; Latches therefor
- F16B 12/58 .. Tapered connectors for bed rails
- F16B 12/60 .. Fittings for detachable side panels

- F16B 13/00** **Dowels or other devices fastened in walls or the like by inserting them in holes made therein for that purpose** (nails [F16B 15/00](#); self-locking pins or bolts in general, stud-and-socket releasable fastenings [F16B 21/00](#); dowels or bolts for railroad sleepers [E01B 9/00](#); ans means for anchoring structural elements or bulkheads specially adapted to foundation engineering [E02D 5/74](#); bolts or dowels used while laying bricks or casting concrete sleepers [E04B 1/38](#); setting anchoring bolts in shafts, tunnels or galleries [E21D 20/00](#); anchoring bolts for shafts, tunnels or galleries [E21D 21/00](#))

- F16B 13/001 . {with means for preventing rotation of the dowel}
- F16B 13/002 . {self-cutting}
- F16B 13/003 .. {with a separate drilling bit attached to or surrounded by the dowel element}
- F16B 13/004 .. {with a drilling sleeve driven against a tapered or spherical plug}

- F16B 13/005 . {formed in integral series but easily separable}

- F16B 13/02 . in one piece with protrusion or ridges on the shaft
- F16B 13/025 .. {of rolled sheet material}

- F16B 13/04 . with parts gripping in the hole or behind the reverse side of the wall after inserting from the front ({[F16B 13/002](#) and [F16B 13/12](#) take precedence;} friction-grip releasable fastenings in general [F16B 2/00](#))
- F16B 13/045 .. {having axially compressing parts allowing the clamping of an object tightly to the wall}
- F16B 13/06 .. combined with expanding sleeve ({[F16B 13/045](#) and [F16B 13/08](#) take precedence})
- F16B 13/061 ... {of the buckling type}
- F16B 13/063 ... {by the use of an expander}
- F16B 13/065 {fastened by extracting the screw, nail or the like}
- F16B 13/066 {fastened by extracting a separate expander-part, actuated by the screw, nail or the like}
- F16B 13/068 {expanded in two or more places}
- F16B 13/08 .. with separate {or non-separate} gripping parts moved into their final position in relation to the body of the device without further manual operation
- F16B 13/0808 ... {by a toggle-mechanism}
- F16B 13/0816 ... {with a wedging drive-pin}
- F16B 13/0825 ... {with a locking element, e.g. sleeve, ring or key co-operating with a cammed or eccentric surface of the dowel body}
- F16B 13/0833 ... {with segments or fingers expanding or tilting into an undercut hole ([F16B 13/0858](#) takes precedence)}
- F16B 13/0841 ... {with a deformable sleeve member driven against the abutting surface of the head of the bolt or of a plug}
- F16B 13/085 ... {with a drive-nail deflected by an inclined surface in the dowel body (nails with spreading shaft [F16B 15/04](#))}

- F16B 13/0858 . . . {with an expansible sleeve or dowel body driven against a tapered or spherical expander plug ([F16B 13/004](#) takes precedence)}
- F16B 13/0866 . . . {with prongs penetrating into the wall of the hole by a retractile movement of a threaded member}
- F16B 13/0875 . . . {with elastic discs or spring washers anchoring in the hole}
- F16B 13/0883 . . . {with split rings or wire between the threads of the dowel body or in grooves near a conical surface ([F16B 13/0825](#) takes precedence)}
- F16B 13/0891 . . . {with a locking element, e.g. wedge, key or ball moving along an inclined surface of the dowel body ([F16B 13/0816](#), [F16B 13/0825](#), [F16B 13/0883](#) take precedence)}

- F16B 13/12 . . . Separate metal {or non-separate or non-metal} dowel sleeves fastened by inserting the screw, nail or the like {([F16B 13/0808](#) takes precedence)}
- F16B 13/122 . . . {made from a sheet-metal blank}
- F16B 13/124 . . . {fastened by inserting a threaded element, e.g. screw or bolt ([F16B 13/122](#), [F16B 13/128](#) take precedence)}
- F16B 13/126 . . . {fastened by inserting an unthreaded element, e.g. pin or nail ([F16B 13/122](#), [F16B 13/128](#) take precedence)}
- F16B 13/128 . . . {with extending protrusions, e.g. discs, segments, ridges, fingers or tongues ([F16B 13/122](#) takes precedence)}

- F16B 13/14 . . . Non-metallic plugs or sleeves {not used, see [F16B 13/002](#)- [F16B 13/12](#)}; Use of liquid, loose solid or kneadable material therefor
- F16B 13/141 . . . {Fixing plugs in holes by the use of settable material}
- F16B 13/142 . . . {characterised by the composition of the setting material or mixture ([F16B 13/143](#) takes precedence)}
- F16B 13/143 . . . {using frangible cartridges or capsules containing the setting components}
- F16B 13/144 {characterised by the shape or configuration or material of the frangible cartridges or capsules}
- F16B 13/145 {characterised by the composition of the setting agents contained in the frangible cartridges or capsules}
- F16B 13/146 . . . {with a bag-shaped envelope or a tubular sleeve closed at one end, e.g. with a sieve-like sleeve, or with an expandable sheath}

Fastening means without screw-thread (horseshoe nails [A01L 7/10](#); nails for footwear [A43B 23/20](#); thumb-tacks [B43M 15/00](#); for building constructions [E04B 1/38](#); for hand railings [E04F 11/18](#); for fencing [E04H 17/00](#))

- F16B 15/00** **Nails; Staples** (surgical staples [A61B 17/064](#); manufacture of nails or staples [B21G](#); {drawing-pins, thumb-tacks [B43M 15/00](#)}; railway spikes [E01B 9/06](#))

- F16B 15/0007 . . . {with two nail points extending in opposite directions, in order to fix two workpieces together}
- F16B 15/0015 . . . {Staples}
- F16B 15/0023 . . . {Nail plates (claw dowels for building structures [E04B 1/49](#); machines for driving in nail plates [B27F 7/15](#))}
- F16B 15/003 . . . {with teeth cut out from the material of the plate}

- F16B 15/0038 . . . {only on the perimeter of the plate}
- F16B 15/0046 . . . {from the body of the plate}
- F16B 15/0053 . . {with separate nails attached to the plate}

- F16B 15/0092 . {Coated nails or staples}

- F16B 15/02 . with specially-shaped heads, e.g. with enlarged surfaces (ornaments for furniture [A47B 95/04](#); removable ornamental heads for nails [A47G 3/00](#))

- F16B 15/04 . with spreading shaft {(dowels with a drive-nail deflected by an inclined surface in the dowel body [F16B 13/085](#))}

- F16B 15/06 . with barbs, e.g. for metal parts; Drive screws

- F16B 15/08 . formed in integral series but easily separable

- F16B 17/00** **Connecting constructional elements or machine parts by a part of or on one member entering a hole in the other** (construction of pins, bolts or rivets [F16B 19/00](#); riveting [F16B 19/04](#); means for preventing withdrawal of a pin, spigot or the like from its operative position, stud-and-socket releasable fastenings [F16B 21/00](#))

- F16B 17/002 . {Non-releasable connections, i.e. by means of plastic deformation}
- F16B 17/004 . . {of rods or tubes mutually}
- F16B 17/006 . . {of rods or tubes to sheets or plates}
- F16B 17/008 . . {of sheets or plates mutually}

- F16B 19/00** **Bolts without screw-thread; Pins, including deformable elements** (in screwed connections [F16B 29/00](#)); **Rivets** (means for preventing withdrawal [F16B 21/00](#))

- F16B 19/002 . {Resiliently deformable pins ([F16B 21/06](#) takes precedence)}
- F16B 19/004 . . {made in one piece ([F16B 21/084](#) takes precedence)}

- F16B 19/008 . {with sealing means}

- F16B 19/02 . Bolts or sleeves for positioning of machine parts, e.g. notched taper pins, fitting pins, sleeves, eccentric positioning rings

- F16B 19/04 . Rivets; Spigots or the like fastened by riveting (lead seals [G09F 3/00](#))
- F16B 19/05 . . Bolts fastening by swaged-on collars ([F16B 19/08](#) takes precedence)
- F16B 19/06 . . Solid rivets made in one piece
- F16B 19/08 . . Hollow rivets; Multi-part rivets
- F16B 19/083 . . . {Self-drilling rivets}
- F16B 19/086 . . . {Self-piercing rivets}
- F16B 19/10 . . . fastened by expanding mechanically

NOTE

Subject matter relating to hollow or single-part rivets fastened by a pull-through mandrel is classified in 19/10B2B

Subject matter relating to hollow or single-part rivets fastened by a drive pin is classified in [F16B 19/1081](#)

- F16B 19/1027 {Multi-part rivets}
- F16B 19/1036 {Blind rivets}
- F16B 19/1045 {fastened by a pull - mandrel or the like ([F16B 19/109](#) takes precedence)}
- F16B 19/1054 { the pull-mandrel or the like being frangible}
- F16B 19/1063 {with a sleeve or collar sliding over the hollow rivet body during the pulling operation}
- F16B 19/1072 { the pull-mandrel or the like comprising a thread and being rotated with respect to the rivet, thereby mechanically expanding and fastening the rivet ([nuts fastened by riveting F16B 37/067](#))}
- F16B 19/1081 {fastened by a drive-pin ([F16B 19/109](#) takes precedence)}
- F16B 19/109 {Temporary rivets, e.g. with a spring-loaded pin ([special clamping devices for workpieces to be riveted together, e.g. operating through the rivet holes B21J 15/42; hand tools for temporarily connecting sheets before or during assembly operations B25B 31/005](#))}
- F16B 19/12 . . . fastened by fluid pressure, including by explosion ([bolts shot by means of detonation-operated nailing tools into concrete constructions, metal walls or the like F16B 19/14](#))
- F16B 19/125 {fastened by explosion}
- F16B 19/14 . . . Bolts or the like for shooting into concrete constructions, metal walls or the like by means of detonation-operated nailing tools ([tools therefor B25C, B27F](#))
- F16B 21/00** **Means for preventing relative axial movement of a pin, spigot, shaft or the like and a member surrounding it** ([riveted or deformable spigots F16B 19/04; for gudgeon pins F16J 1/18](#)); **Stud-and-socket releasable fastenings**
- F16B 21/02 . . . Releasable fastening devices locking by rotation ([with snap-action F16B 21/06; studs or coupling pins with resilient protrusions 21/08](#))
- F16B 21/04 . . . with bayonet catch
- F16B 21/06 . . . Releasable fastening devices with snap-action [{\(quickly-detachable or mountable nuts to threaded bolts F16B 37/0842\)}](#)
- F16B 21/065 . . . {with an additional locking element}
- F16B 21/07 . . . in which the socket has a resilient part [{\(F16B 21/065 takes precedence\)}](#)
- F16B 21/071 . . . { the socket being integrally formed with a component to be fastened, e.g. a sheet, plate or strip}
- F16B 21/073 . . . { the socket having a resilient part on its inside}
- F16B 21/075 { the socket having resilient parts on its inside and outside}
- F16B 21/076 . . . { the socket having a resilient part on its outside ([F16B 21/075 takes precedence](#))}
- F16B 21/078 . . . { the socket having a further molded-in or embedded component, e.g. a ring with snap-in teeth molded into it ([F16B 21/065 takes precedence](#))}
- F16B 21/08 . . . in which the stud, pin, or spigot has a resilient part ([{F16B 21/065, F16B 21/125, F16B 21/165, F16B 37/043 take precedence}](#)); [wall-dowels F16B 13/00](#))

- F16B 21/082 . . . {the stud, pin or spigot having two resilient parts on its opposite ends in order to connect two elements}
- F16B 21/084 . . . { with a series of flexible ribs or fins extending laterally from the shank of the stud, pin or spigot, said ribs or fins deforming predominantly in a direction parallel to the direction of insertion of the shank}
- F16B 21/086 . . . { the shank of the stud, pin or spigot having elevations, ribs, fins or prongs intended for deformation or tilting predominantly in a direction perpendicular to the direction of insertion}
- F16B 21/088 . . . { the stud, pin or spigot being integrally formed with the component to be fastened, e.g. forming part of the sheet, plate or strip}

- F16B 21/09 . . . Releasable fastening devices with a stud engaging a keyhole slot

- F16B 21/10 . . . by separate parts ({[F16B 21/06](#) takes precedence}; key-type connection [F16B 3/00](#); locking screws or nuts against rotation by such means [F16B 39/04](#))
- F16B 21/12 . . . with locking-pins or split-pins thrust into holes
- F16B 21/125 . . . {radially resilient or with a snap-action member, e.g. elastic tooth, pawl with spring, resilient coil or wire}
- F16B 21/16 . . . with grooves or notches in the pin or shaft
- F16B 21/165 . . . {with balls or rollers (for connections of rods or tubes engaged telescopically [F16B 7/1409](#))}
- F16B 21/18 . . . with circlips or like resilient retaining devices, {i.e. resilient in the plane of the ring or the like}; Details (spring-washers for locking nuts [F16B 39/24](#); adjusting rings [F16B 43/00](#))
- F16B 21/183 {internal, i.e. with spreading action}
- F16B 21/186 {external, i.e. with contracting action}
- F16B 21/20 . . . for bolts or shafts without holes, grooves, or notches for locking members {(by rings resilient in their plane [F16B 21/18](#))}
- F16B 21/205 . . . {the connecting means having gripping edges in the form of a helix}

Fastening means using screw-thread ([wall-dowels F16B 13/00](#); manufacture of threaded fastening means [B21H](#), [B21K](#), [B23G](#); screws or bolts for railway sleepers [E01B 9/10](#); screw mechanisms [F16H](#))

- F16B 23/00** **Specially shaped {nuts or} heads of bolts or screws for rotations by a tool** {(detachable ornamental heads for screws [A47G 3/00](#); screwdrivers, wrenches [B25B](#))}

- F16B 23/0007 . . . {characterised by the shape of the recess or the protrusion engaging the tool ([F16B 23/0069](#) and [F16B 23/0076](#) take precedence)}
- F16B 23/0015 . . . {substantially rectangular, e.g. one-slot head}
- F16B 23/0023 . . . {substantially cross-shaped}
- F16B 23/003 . . . {star-shaped or multi-lobular, e.g. Torx-type, twelve-point star}
- F16B 23/0038 . . . {substantially prismatic with up to six edges, e.g. triangular, square, pentagonal, Allen-type cross-sections}
- F16B 23/0046 . . . {having one eccentric circular or polygonal recess or protrusion}
- F16B 23/0053 . . . {with a conical or prismatic recess for receiving a centering pin of the tool apparatus}

- F16B 23/0061 . {with grooves, notches or splines on the external peripheral surface designed for tools engaging in radial direction ([F16B 23/003](#) takes precedence)}
- F16B 23/0069 . {with holes to be engaged with corresponding pins on the tool or protruding pins to be engaged with corresponding holes on the tool}
- F16B 23/0076 . {causing slipping of the tool in loosening rotation, i.e. disabling unscrewing unless another tool is used ([F16B 31/027](#) takes precedence)}
- F16B 23/0084 . {with a threaded engagement between the head of the bolt or screw and the tool}
- F16B 23/0092 . {with a head engageable by two or more different tools ([F16B 23/0076](#) takes precedence)}

- F16B 25/00** **Screws that cut thread in the body into which they are screwed, e.g. wood screws**
{([F16B 35/065](#) takes precedence; joining sheets or plates using screws with two separate threads [F16B 5/0275](#), using screws with adjustment sleeves [F16B 5/0283](#))}

- F16B 25/0005 . {of the helical wire type ([Threaded wire-inserts F16B 37/12](#))}
- F16B 25/001 . { characterised by the material of the body into which the screw is screwed}
- F16B 25/0015 .. { the material being a soft organic material, e.g. wood or plastic ([F16B 25/0031](#) takes precedence)}
- F16B 25/0021 .. { the material being metal, e.g. sheet-metal or aluminium ([F16B 25/0031](#) takes precedence)}
- F16B 25/0026 .. { the material being a hard non-organic material, e.g. stone, concrete or drywall ([F16B 25/0031](#) takes precedence)}
- F16B 25/0031 .. { the screw being designed to be screwed into different materials, e.g. a layered structure or through metallic and wooden parts}

- F16B 25/0036 . { characterised by geometric details of the screw}
- F16B 25/0042 .. { characterised by the geometry of the thread, the thread being a ridge wrapped around the shaft of the screw}
- F16B 25/0047 ... { the ridge being characterised by its cross-section in the plane of the shaft axis}
- F16B 25/0052 ... { the ridge having indentations, notches or the like in order to improve the cutting behaviour}
- F16B 25/0057 ... { the screw having distinct axial zones, e.g. multiple axial thread sections with different pitch or thread cross-sections}
- F16B 25/0063 { with a non-threaded portion on the shaft of the screw}
- F16B 25/0068 ... { with multiple-threads, e.g. a double thread screws}
- F16B 25/0073 ... { characterised by its pitch, e.g. a varying pitch}
- F16B 25/0078 .. { with a shaft of non-circular cross-section or other special geometric features of the shaft}
- F16B 25/0084 .. { characterised by geometric details of the tip}
- F16B 25/0089 .. { the screw having wings}
- F16B 25/0094 .. { the screw being assembled or manufactured from several components, e.g. a tip out of a first material welded to shaft of a second material}

- F16B 25/10 . Screws performing an additional function to thread-forming, e.g. drill screws {or

- self-piercing screws}
- F16B 25/103 . . {by means of a drilling screw-point, i.e. with a cutting and material removing action}
- F16B 25/106 . . {by means of a self-piercing screw-point, i.e. without removing material}

- F16B 27/00** **Bolts, screws, or nuts formed in integral series but easily separable, particularly for use in automatic machines** {(Arrangements for feeding screws or nuts in spanners, wrenches or screw-drivers with built-in magazines [B25B 23/06](#))}

- F16B 29/00** **Screwed connection with deformation of nut or auxiliary member while fastening** ({Nuts fastened to surfaces by riveting [F16B 37/065](#)}; members deformed for locking screws, bolts or nuts [F16B 39/22](#))

- F16B 31/00** **Screwed connections specially modified in view of tensile load; Break-bolts** (shape of thread {[F16B 33/02](#); in couplings [F16D 9/00](#)})

- F16B 31/005 . {Breakbolts loosening due to the action of an explosive charge}
- F16B 31/007 . {Break-bolts loosening at high temperature}
- F16B 31/02 . for indicating {the attainment of a particular tensile load} or limiting tensile load {(apparatus for, or method of, determining value of torque or twisting moment for tightening a nut or other member similarly stressed [G01L 5/24](#))}
- F16B 31/021 . . {by means of a frangible part ([F16B 31/025](#), [F16B 31/028](#) take precedence; break members in torque limiters or torque indicators in wrenches or screwdrivers [B25B 23/1415](#))}
- F16B 31/024 . . {with the bottom of the nut or of the head of the bolt having gaps which close as the bolt tension increases, e.g. with lips or with a load-indicating flange}
- F16B 31/025 . . {with a gauge pin in a longitudinal bore in the body of the bolt}
- F16B 31/027 . . {with a bolt head causing the fastening or the unfastening tool to lose the grip when a specified torque is exceeded}
- F16B 31/028 . . {with a load-indicating washer or washer assembly}

- F16B 31/04 . for maintaining {a} tensile load
- F16B 31/043 . . {Prestressed connections tensioned by means of liquid, grease, rubber, explosive charge, or the like ([hydraulic bolt tensioners B25B 29/02](#))}

- F16B 31/06 . having regard to possibility of fatigue rupture

- F16B 33/00** **Features common to bolt and nut**

- F16B 33/002 . {Means for preventing rotation of screw-threaded elements ([F16B 39/00](#) takes precedence)}

- F16B 33/004 . {Sealing; Insulation (by means of washers [F16B 43/001](#))}

- F16B 33/006 . {Non-metallic fasteners using screw-thread}

- F16B 33/008 . {Corrosion preventing means}

- F16B 33/02 . Shape of thread; Special thread-forms ({F16B 25/00 takes precedence; used to remove paint or dirt layers F16B 35/007, F16B 37/002}; used as screw-locking device F16B 39/30)
- F16B 33/06 . Surface treatment of parts furnished with screw-thread, e.g. for preventing seizure {or fretting (corrosion preventing means F16B 33/008; settable coatings for locking threaded members F16B 39/225; deformable coatings for locking threaded members F16B 39/34)}

F16B 35/00 **Screw-bolts; Stay-bolts; Screw-threaded studs; Screws; Set screws** ({F16B 33/008 takes precedence; joining sheets or plates using screws with two separate threads F16B 5/0275; using screws with adjustment sleeves 5/02S}; thread cutting screws F16B 25/00)

NOTE

The fastening of heads of screws or heads of bolts to surfaces is classified in F16B 37/04

- F16B 35/002 . {onto which threads are cut during screwing (F16B 37/002 takes precedence)}
- F16B 35/005 . {Set screws; Locking means therefor}
- F16B 35/007 . {Removing paint or dirt layers covering the threaded part of nut-like members}
- F16B 35/02 . divided longitudinally
- F16B 35/04 . with specially-shaped head or shaft in order to fix the bolt on or in an object (locking the bolt against turning in the object by the use of accessory parts F16B 39/00)
- F16B 35/041 .. {Specially-shaped shafts (shape of thread F16B 33/02)}
- F16B 35/042 ... {for retention or rotation by a tool, e.g. of polygonal cross-section}
- F16B 35/044 ... {Specially-shaped ends}
- F16B 35/045 {for retention or rotation by a tool (specially shaped heads of bolts or screws for rotation by a tool F16B 23/00)}
- F16B 35/047 {for preventing cross-threading, i.e. preventing skewing of bolt and nut}
- F16B 35/048 ... {Specially-shaped necks (F16B 35/06 takes precedence)}
- F16B 35/06 .. Specially-shaped heads (special shape in order to rotate the bolt F16B 23/00){(separate hook adaptors for bolts F16B 43/025)}
- F16B 35/065 ... {with self-countersink-cutting means}

F16B 37/00 **Nuts or like thread-engaging members** {(specially shaped for rotations by a tool F16B 23/00)}

- F16B 37/002 . {cutting threads during screwing; removing paint or dirt layers covering threaded shanks}
- F16B 37/005 . {into which threads are cut during screwing}
- F16B 37/02 . made of thin sheet material (fastening to surfaces F16B 37/04; {used as lock-nuts

[F16B 39/14](#))

- F16B 37/04 . Devices for fastening nuts to surfaces, e.g. sheets, plates {(nuts fastened behind a wall by a toggle-mechanism [F16B 13/0808](#); threaded inserts [F16B 37/122](#); measures against loss of bolts, nuts or pins [F16B 41/002](#)}
- F16B 37/041 .. {Releasable devices ([F16B 37/044](#), [F16B 37/045](#) take precedence)}
- F16B 37/042 ... {locking by rotation}
- F16B 37/043 ... {with snap action}
- F16B 37/044 .. {Nut cages}
- F16B 37/045 .. {specially adapted for fastening in channels, e.g. sliding bolts, channel nuts}
- F16B 37/046 ... {with resilient means for urging the nut inside the channel}
- F16B 37/047 ... {Barrel nuts}
- F16B 37/048 .. {Non-releasable devices ([F16B 37/044](#), [F16B 37/045](#) and [F16B 37/06](#) take precedence)}
- F16B 37/06 .. by means of welding or riveting
- F16B 37/061 ... {by means of welding}
- F16B 37/062 ... {by means of riveting}
- F16B 37/064 {with the use of separate rivets}
- F16B 37/065 {by deforming the material of the nut}
- F16B 37/067 {the material of the nut being deformed by a threaded member generating axial movement of the threaded part of the nut, e.g. blind rivet type}
- F16B 37/068 {by deforming the material of the support, e.g. the sheet or plate}
- F16B 37/08 . Quickly-detachable {or mountable} nuts, e.g. consisting of two or more parts ; Nuts movable along the bolt after tilting the nut {not used, see subgroups}
- F16B 37/0807 .. {Nuts engaged from the end of the bolt, e.g. axially slidable nuts}
- F16B 37/0814 ... {movable along the bolt after tilting the nut}
- F16B 37/0821 ... {in two halves pivotally connected}
- F16B 37/0828 ... {with a longitudinal slit through the annular wall of the nut for enabling expansion of the nut, e.g. for easy removal}
- F16B 37/0835 ... {with balls engaging threads or grooves on the shaft of the bolt}
- F16B 37/0842 ... {fastened to the threaded bolt with snap-on-action, e.g. push-on nuts for stud bolts ([F16B 37/0857](#) takes precedence; snap-on-action of a pin, spigot, shaft or the like and a member surrounding it [F16B 21/06](#))}
- F16B 37/085 ... {with at least one unthreaded portion in both the nut and the bolt}
- F16B 37/0857 ... {with the threaded portions of the nut engaging the thread of the bolt by the action of one or more springs or resilient retaining members ([F16B 37/0821](#) and [F16B 37/0835](#) take precedence)}
- F16B 37/0864 ... {with the threaded portions of the nut engaging the thread of the bolt by pressing or rotating an external retaining member such as a cap, a nut, a ring or a sleeve ([F16B 37/0835](#) takes precedence)}
- F16B 37/0871 .. {engaging the bolt laterally, i.e. without the need to engage the end of the bolt}
- F16B 37/0878 ... {in one piece, e.g. C-shaped nuts}
- F16B 37/0885 ... {in two halves hingedly connected}
- F16B 37/0892 ... {in two or more pieces, e.g. assemblies made by two C-shaped nuts mutually

interlocked, or retained by an additional member ([F16B 37/0885](#) takes precedence)}

- F16B 37/12 . with thread-engaging surfaces formed by inserted coil-springs, discs, or the like; Independent pieces of wound wire used as nuts; Threaded inserts for holes {[Mounting devices B25B 27/143](#)}
- F16B 37/122 .. {Threaded inserts, e.g. "rampa bolts"}
- F16B 37/125 ... {the external surface of the insert being threaded}
- F16B 37/127 {and self-tapping}
- F16B 37/14 . Cap nuts; Nut caps or bolt caps
- F16B 37/145 .. {Sleeve nuts, e.g. combined with bolts}
- F16B 37/16 . Wing-nuts ([F16B 37/14](#) takes precedence)

F16B 39/00 **Locking of screws, bolts or nuts** ({[F16B 35/005](#) takes precedence}; locking of bottle closures [B65D](#); locking of rail-fastening bolts for permanent ways [E01B 9/12](#); locking of fastening means for railway fishplates [E01B 11/38](#); locking devices for valves or cocks [F16K](#))

NOTE

In this group, heads of screws or bolts are put on a par with nuts as far as pertains to locking; an object into which a screw is threaded is put on a par with a nut.

- F16B 39/01 . specially adapted to prevent loosening at extreme temperatures
- F16B 39/02 . in which the locking takes place after screwing down ([F16B 39/01](#) takes precedence; split-pins, circlips, or the like for preventing relative axial movement only [F16B 21/10](#); fastening nuts by welding or riveting [F16B 37/06](#))
- F16B 39/021 .. {by injecting a settable material after the screwing down}
- F16B 39/023 .. {by driving a conic or wedge-shaped expander through the threaded element}
- F16B 39/025 .. {by plastic deformation of a part of one of the threaded elements into a notch or cavity of the other threaded element ([F16B 39/103](#) and [F16B 39/106](#) take precedence)}
- F16B 39/026 .. {by swaging the nut on the bolt, i.e. by plastically deforming the nut}
- F16B 39/028 .. {by means of an auxiliary bolt or threaded element whose action provokes the deformation of the main bolt or nut and thereby its blocking}
- F16B 39/04 .. with a member penetrating the screw-threaded surface of at least one part, e.g. a pin, a wedge, cotter-pin, screw
- F16B 39/06 ... with a pin or staple parallel to the bolt axis
- F16B 39/08 .. with a cap interacting with the nut, connected to the bolt by a pin or cotter pin
- F16B 39/10 .. by a plate, {spring, wire} or ring immovable with regard to the bolt or object {and mainly perpendicular to the axis of the bolt}([F16B 39/08](#) takes precedence)
- F16B 39/101 ... {with a plate, spring, wire or ring holding two or more nuts or bolt heads which are mainly in the same plane}
- F16B 39/103 ... {with a locking cup washer, ring or sleeve surrounding the nut or bolt head and being partially deformed on the nut or bolt head, or on the object itself}
- F16B 39/105 {locking the bold head or nut into a hole or cavity, e.g. with the cup washer,

- ring or sleeve deformed into a dimple in the cavity}
- F16B 39/106 . . . {with a deformable locking element, e.g. disk or pin above the bolt head or nut, flattened into a hole or cavity within which the bolt head or nut is positioned}
- F16B 39/108 . . . {with a locking washer under the nut or bolt head having at least one tongue or lug folded against the nut or bolt head, or against the object itself ([F16B 39/103](#) takes precedence)}
- F16B 39/12 . . by means of locknuts
- F16B 39/122 . . . {foreseen with mating surfaces inclined, i.e. not normal, to the bolt axis}
- F16B 39/124 {with helically inclined mating surfaces}
- F16B 39/126 . . . {causing radial forces on the bolt-shaft ([F16B 39/36](#) takes precedence)}
- F16B 39/128 {by means of eccentric or spiral interengaging parts}
- F16B 39/14 . . . made of thin sheet material or formed as spring-washers (locknuts per se made of thin sheet metal [F16B 37/02](#))
- F16B 39/16 . . . in which the screw-thread of the locknut differs from that of the nut
- F16B 39/18 in which the locknut grips with screw-thread in the nuts as well as on the bolt
- F16B 39/20 . . by means of steel wire or the like ([F16B 39/10](#) takes precedence)
- F16B 39/22 . . in which the locking takes place during screwing down or tightening ([F16B 39/01](#) takes precedence)
- F16B 39/225 . . {by means of a settable material}
- F16B 39/24 . . by means of washers, spring washers, or resilient plates that lock against the object (locking to the screw-thread [F16B 39/14](#), {[F16B 39/34](#)}, [F16B 39/36](#))
- F16B 39/26 . . . with spring washers fastened to the nut or bolt-head
- F16B 39/28 . . by special members on, or shape of, the nut or bolt ([F16B 39/26](#) takes precedence; locknuts [F16B 39/12](#))
- F16B 39/282 . . . Locking by means of special shape of work-engaging surfaces, e.g. notched or toothed nuts
- F16B 39/2825 {causing the bolt to tilt}
- F16B 39/284 . . . Locking by means of elastic deformation ({[F16B 39/2825](#), [F16B 39/36](#)}, [F16B 39/38](#) take precedence)
- F16B 39/286 caused by saw cuts
- F16B 39/30 . . . Locking exclusively by special shape of the screw-thread
- F16B 39/32 . . . Locking by means of a pawl or pawl-like tongue
- F16B 39/34 . . . Locking by deformable inserts or like parts
- F16B 39/36 . . . with conical locking parts, which may be split, including use of separate rings co-operating therewith
- F16B 39/38 . . . with a second part of the screw-thread which may be resiliently mounted ([F16B 39/30](#) takes precedence)
- F16B 41/00** **Measures against loss of bolts, nuts, or pins; Measures against unauthorised operation of bolts, nuts or pins** ({locking of screws, bolts or nuts [F16B 39/00](#);} seals [G09F 3/00](#))
- F16B 41/002 . . {Measures against loss of bolts, nuts or pins (devices for fastening nuts to surfaces [F16B 37/04](#))}

- F16B 41/005 . {Measures against unauthorised operation of bolts, nuts or pins ([F16B 23/0007](#), [F16B 23/0061](#), [F16B 23/0069](#), [F16B 23/0076](#) and [F16B 31/02](#) take precedence; locks, keys [E05B](#); for valves, taps or cocks [F16K 35/00](#); for pipe-joints with swivel-nuts [F16L 19/005](#))}
- F16B 41/007 . . {by means of two housings hingedly connected which enclose the bolt head}
- F16B 43/00 Washers or equivalent devices; Other devices for supporting bolt-heads or nuts** (circlips [F16B 21/18](#); {for indicating tensile load [F16B 31/02](#); forming a whole with the bolt or nut [F16B 33/00](#); locking bolts or nuts by means of a fixed plate or ring, or washer-like resilient plates [F16B 39/10](#), [F16B 39/24](#)})
- F16B 43/001 . {for sealing or insulation}
- F16B 43/002 . {with special provisions for reducing friction}
- F16B 43/003 . {with a special hole shape in order to allow a quick mounting or dismounting of the washer, e.g. with a keyhole slot ([F16B 43/005](#) takes precedence)}
- F16B 43/004 . {with a radial cut in order to improve elasticity of the washer ([F16B 43/005](#) takes precedence)}
- F16B 43/005 . {engaging the bolt laterally to allow a quick mounting or dismounting of the washer, i.e. without the need to engage over the end of the bolt ([F16B 43/009](#) takes precedence)}
- F16B 43/006 . . {in two or more parts hingedly connected}
- F16B 43/007 . . {in two or more parts}
- F16B 43/009 . {with a wedging effect in order to adjust the height of the washer}
- F16B 43/02 . with special provisions for engaging surfaces which are not perpendicular to a bolt axis or do not surround the bolt
- F16B 43/025 . . {for surfaces not surrounding the bolt, e.g. hook adaptors for bolts}
- F16B 45/00 Hooks; Eyes** (if the attaching parts or means are concerned, groups [F16B 13/00](#), [F16B 15/00](#), [F16B 19/00](#), [F16B 25/00](#), [F16B 35/00](#), [F16B 47/00](#) take precedence; for hanging pictures or the like [A47G 1/16](#); towing hooks for ships [B63B 21/58](#); for hoisting or hauling purposes [B66C](#); hooks or eyes with integral parts designed to facilitate quick attachment to cables or ropes at any point [F16G 11/14](#))
- F16B 45/02 . Hooks with a pivoting {or elastically bending} closing member
- F16B 45/025 . . {manoeuvrable remotely with a cable, chain, rod or the like}
- F16B 45/04 . Hooks with a sliding closing member
- F16B 45/06 . Hooks with two symmetrically-pivoting hook parts
- F16B 47/00 Suction cups for attaching purposes; Equivalent means using adhesives** {(devices using adhesives, suction or magnetism for hanging or supporting pictures or the like [A47G 1/17](#); vacuum work holders [B25B 11/005](#); anchoring of ships using suction [B63B 21/27](#); suction cups for handling glass [B65G 49/061](#); load-engaging elements for cranes using suction means [B66C 1/02](#))}

F16B 47/003 . {using adhesives for attaching purposes (using adhesives for connecting constructional elements [F16B 11/006](#))}

F16B 47/006 . {the suction cups being activated by the rotation of a cranked lever arm}

F16B 2001/00 Devices for securing together, or preventing relative movement between, constructional elements or machine parts

F16B 2001/0007 . Fasteners made by sintering powders

F16B 2001/0021 . Friction-reducing coatings

F16B 2001/0028 . by the use of a material of the hooks-and-loops type

F16B 2001/0035 . by the use of a magnetic material

F16B 2001/0042 . by the use of an explosive charge ([F16B 19/125](#), [F16B 31/005](#) take precedence)

F16B 2001/0064 . and establishing a good electrical connection

F16B 2001/0078 . having differing thermal expansion coefficients

F16B 2001/0085 . Ceramic-to-metal-connections

F16B 2001/0092 . with means for avoiding incorrect assembly or positioning

F16B 2005/00 Joining sheets or plates, {e.g. panels}, to one another or to strips or bars parallel to them ({[F16B 17/002](#) takes precedence}; by sticking together [F16B 11/00](#); dowel connections [F16B 13/00](#); pins, including deformable elements [F16B 19/00](#); covering of walls [E04F 13/00](#); fastening signs, plates, panels or boards to a supporting structure, fastening readily-detachable elements, e.g. letters to signs, plates, panels, or boards, [G09F 7/00](#))

F16B 2005/06 . by means of clamps or clips ({[F16B 5/0004](#) takes precedence}; friction-grip releasable fastenings in general [F16B 2/00](#))

F16B 2005/0607 .. {joining sheets or plates to each other ([F16B 5/0692](#), [F16B 21/082](#) take precedence)}

F16B 2005/0621 ... {in parallel relationship (fastened by a drive-pin [19/10B2D](#); fastened by a device locking by rotation [F16B 21/02](#))}

F16B 2005/0671 with unlocking by rotation

F16B 2005/0678 ... in abutting relationship

F16B 2007/00 Connections of rods or tubes, e.g. of non-circular section, mutually, including resilient connections ({[F16B 11/008](#), [F16B 17/002](#) take precedence}; umbrella frames [A45B 25/02](#); welding or soldering of connections [B23K](#); vehicle connections in general [B60D](#); railway couplings [B61G](#); bicycle frames [B62K](#); couplings for transmitting rotation [F16D](#); couplings for tubes conveying fluids [F16L](#))

- F16B 2007/10 . Telescoping systems { for vertically adjustable chairs [A47C 3/20](#); telescopic steering columns [B62D 1/18](#)}; for scaffolding [E04G 25/04](#); { telescopic masts, poles or the like [E04H 12/18B](#); telescopic door or window holders [E05C 17/30](#)}; telescope props for mining [E21D 15/14](#) to [E21D 15/46](#); stands or trestles as supports for apparatus or articles placed thereon {[F16M 11/26](#)}
- F16B 2007/14 . . locking in intermediate {non-discrete} positions {(the rod or tube being locked by a tilting clip [F16B 2/246](#))}
- F16B 2007/16 . . . locking only against movement in one direction
- F16B 2012/00** **Jointing of furniture or the like, e.g. hidden from exterior ([F16B 2/00](#) to [F16B 11/00](#) take precedence; fastening means per se [F16B 13/00](#) to [F16B 47/00](#); wood-working B27)**
- F16B 2012/04 . Non-loosenable joints for non-metal furniture parts, e.g. glued
- F16B 2012/043 . . using carpentry joints other than mortise and tenon joints, e.g. using multiple tenons
- F16B 2012/046 . . using mortise and tenon joints
- F16B 2012/10 . using pegs, bolts, tenons, clamps, clips, or the like (glued [F16B 12/04](#); fastening means per se [F16B 15/00](#) to [F16B 47/00](#))
- F16B 2012/103 . . Sleeves or dowels for connection fittings
- F16B 2012/106 . . Connection bolts for connection fittings
- F16B 2012/12 . . for non-metal furniture parts, e.g. made of wood, of plastics
- F16B 2012/14 . . . using threaded bolts or screws
- F16B 2012/145 Corner connections
- F16B 2012/20 . . . using clamps, clips, wedges, sliding bolts, or the like
- F16B 2012/2009 {actuated by rotary motion}
- F16B 2012/2018 pin and drum securing device; drum has cam surface to engage the head of the pin
- F16B 2012/2045 pin and drum securing device; drum has screw to engage the head of the pin
- F16B 2012/2072 Pin and drum securing devices; Drums having lever with cam surface to engage the head of the pin
- F16B 2012/2081 having a fitting providing slanted access for a screwdriver as actuator
- F16B 2012/209 having an integrated lever as actuator
- F16B 2012/40 . Joints for furniture tubing
- F16B 2012/403 . . with inserts for joining tubes coaxially
- F16B 2012/406 . . Cove joints for joining two cylindrical members
- F16B 2012/44 . Leg joints; Corner joints
- F16B 2012/443 . . with two-dimensional corner element, the legs thereof being inserted in hollow frame members
- F16B 2012/446 . . with three-dimensional corner element, the legs thereof being inserted in hollow frame members
- F16B 2012/46 . . Non-metal corner connections
- F16B 2012/463 . . . for wooden members without additional elements

- F16B 2012/466 . . . using mortise and tenon joints
- F16B 2012/50 . . Metal corner connections
- F16B 2012/505 . . . having a corner insert which is inserted in mitered profiled members
- F16B 2013/00** **Dowels or other devices fastened in walls or the like by inserting them in holes made therein for that purpose** (nails [F16B 15/00](#); self-locking pins or bolts in general, stud-and-socket releasable fastenings [F16B 21/00](#); dowels or bolts for railroad sleepers [E01B 9/00](#); ans means for anchoring structural elements or bulkheads specially adapted to foundation engineering [E02D 5/74](#); bolts or dowels used while laying bricks or casting concrete sleepers [E04B 1/38](#); setting anchoring bolts in shafts, tunnels or galleries [E21D 20/00](#); anchoring bolts for shafts, tunnels or galleries [E21D 21/00](#))
- F16B 2013/006 . with sealing means
- F16B 2013/007 . to be fastened in undercut holes
- F16B 2013/008 . used for mining purposes
- F16B 2013/009 . Double sleeve dowels, i.e. the first sleeve is fixed in a hole by the action of a second sleeve and one of the sleeves receives a nail, a screw or the like
- F16B 2013/04 . with parts gripping in the hole or behind the reverse side of the wall after inserting from the front ([F16B 13/002](#) and [F16B 13/12](#) take precedence; friction-grip releasable fastenings in general [F16B 2/00](#))
- F16B 2013/10 . . with gripping parts moved into their final position in relation to the body of the device by a separate operation
- F16B 2013/105 . . . with a toggle-mechanism
- F16B 2013/14 . Non-metallic plugs or sleeves {not used, see [F16B 13/002](#)- [F16B 13/12](#)}; Use of liquid, loose solid or kneadable material therefor
- F16B 2013/141 . . {Fixing plugs in holes by the use of settable material}
- F16B 2013/147 . . . Grout with reinforcing elements or with fillers, e.g. fibres, flakes, balls, wires
- F16B 2013/148 . . . Means for inhibiting adhesion between dowel or anchor bolt parts and the surrounding grouting composition
- F16B 2015/00** **Nails; Staples** (surgical staples [A61B 17/064](#); manufacture of nails or staples [B21G](#); {drawing-pins, thumb-tacks [B43M 15/00](#)}; railway spikes [E01B 9/06](#))
- F16B 2015/0023 . {Nail plates (claw dowels for building structures [E04B 1/49](#); machines for driving in nail plates [B27F 7/15](#))}
- F16B 2015/0061 . . Multipiece-plates
- F16B 2015/0069 . . with nails on both sides
- F16B 2015/0076 . . with provisions for additional fastening means, e.g. hooks, holes for separate screws or nails, adhesive
- F16B 2015/0084 . . with marks to indicate where to strike with the hammer
- F16B 2019/00** **Bolts without screw-thread; Pins, including deformable elements** (in screwed connections [F16B 29/00](#)); **Rivets** (means for preventing withdrawal [F16B 21/00](#))

- F16B 2019/002 . {Resiliently deformable pins ([F16B 21/06](#) takes precedence)}
- F16B 2019/006 .. made in a plurality of pieces
- F16B 2019/04 . Rivets; Spigots or the like fastened by riveting ([lead seals G09F 3/00](#))
- F16B 2019/045 .. Coated rivets
- F16B 2019/05 .. Bolts fastening by swaged-on collars ([F16B 19/08](#) takes precedence)
- F16B 2019/055 ... deformed by an electro-magnetic action
- F16B 2019/08 .. Hollow rivets; Multi-part rivets
- F16B 2019/10 ... fastened by expanding mechanically

NOTE

Subject matter relating to hollow or single-part rivets fastened by a pull-through mandrel is classified in [19/10B2B](#)

Subject matter relating to hollow or single-part rivets fastened by a drive pin is classified in [F16B 19/1081](#)

- F16B 2019/1009 hollow or single-part rivets fastened by a pull-through mandrel
- F16B 2019/1018 hollow or single-part rivets fastened by a drive pin

F16B 2021/00 Means for preventing relative axial movement of a pin, spigot, shaft or the like and a member surrounding it ([riveted or deformable spigots F16B 19/04](#); for gudgeon pins [F16J 1/18](#)); Stud-and-socket releasable fastenings

- F16B 2021/10 . by separate parts ([F16B 21/06](#) takes precedence); key-type connection [F16B 3/00](#); locking screws or nuts against rotation by such means [F16B 39/04](#))
- F16B 2021/12 .. with locking-pins or split-pins thrust into holes
- F16B 2021/14 ... Details of locking-pins or split-pins

F16B 2031/00 Screwed connections specially modified in view of tensile load; Break-bolts (shape of thread [F16B 33/02](#); in couplings [F16D 9/00](#))

- F16B 2031/002 . Breakbolts loosening due to an electromagnetic action
- F16B 2031/02 . for indicating {the attainment of a particular tensile load} or limiting tensile load {(apparatus for, or method of, determining value of torque or twisting moment for tightening a nut or other member similarly stressed [G01L 5/24](#))}
- F16B 2031/022 .. using an ultrasonic transducer
- F16B 2031/04 . for maintaining {a} tensile load
- F16B 2031/043 .. {Prestressed connections tensioned by means of liquid, grease, rubber, explosive charge, or the like (hydraulic bolt tensioners [B25B 29/02](#))}
- F16B 2031/046 ... by means of an explosive charge

F16B 2033/00 Features common to bolt and nut

- F16B 2033/02 . Shape of thread; Special thread-forms ([F16B 25/00](#) takes precedence; used to

- remove paint or dirt layers [F16B 35/007](#), [F16B 37/002](#)}; used as screw-locking device [F16B 39/30](#))
- [F16B 2033/025](#) . . with left-hand thread
- [F16B 2033/04](#) . . in view of tensile load
- F16B 2037/00** **Nuts or like thread-engaging members** {(specially shaped for rotations by a tool [F16B 23/00](#))}
- [F16B 2037/007](#) . with a blind hole
- F16B 2043/00** **Washers or equivalent devices; Other devices for supporting bolt-heads or nuts** (circlips [F16B 21/18](#); {for indicating tensile load [F16B 31/02](#); forming a whole with the bolt or nut [F16B 33/00](#); locking bolts or nuts by means of a fixed plate or ring, or washer-like resilient plates [F16B 39/10](#), [F16B 39/24](#)})
- [F16B 2043/008](#) . with a cavity for receiving the bolt head in order to make a flush surface